

App. No. 10/027,677

Amendment mailed November 4, 2004

Re: Office Action mailed May 4, 2004

AMENDMENTS TO THE SPECIFICATION

IN THE DESCRIPTION

Please replace paragraph [0287] with the following rewritten paragraph:

[0287] An example of the modified drill stem system for a coke drum with a side draw vapor line is shown in Figures 7A-7B. In this equipment diagram, the modified drill stem 710 passes through a sealing apparatus 715 mounted on the cover of a reinforced flange 720 in the center of the coke drum. Normally, this may be the same flange used for the existing drill stem to drill out the coke in the decoking cycle. At the end of the decoking cycle, the existing coke drum derrick 740 is typically used to position the modified drill stem. Initially, the modified drill stem is normally retracted with sealing apparatus 715 welded to flange plate near the spray nozzle end. After the flange is properly bolted and the drum is pressure checked, the modified drill stem is lowered into the drum to its maximum extension. During this descent in the drum, the modified drill stem can be designed to provide additional benefit of moderating coke drum warm-up (e.g. steam injection). As the coking cycle begins, pressurized quench media is injected into the coke drum above the coke mass via spray nozzle(s) 750. An automated control system, designed for each specific coker, would be used to assure that the modified drill stem would be moved vertically upward (i.e. retracted) at a rate that maintains at least a minimum distance (e.g., ~~2-20 feet~~; 0.5-20 feet, preferably 2-10 feet, more preferably 5-10 feet) above the coke mass, as the coke drum fills. This minimum distance can depend on the anti-foaming effect of the quench media. As noted previously, certain chemical additives in the quench media can increase the anti-foaming effect. The automated control system would preferably have fail-safe design modes and operational procedures to assure the modified drill stem does not get stuck. The high-pressure nozzles and rotational motion of the modified drill stem (e.g. similar to decoking drill stem) would be designed to optimize spray coverage of the cross-

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sectional area of the coke drum. Full spray coverage of the drum cross-sectional area is not necessary to achieve desirable results. That is, cooler temperatures near the drum walls and quench media diffusional effects will help the quench (chemical and/or thermal) as the vapors move upward in the coke drum. At the end of the coking cycle, the modified drill stem is fully retracted. After cooling and depressurizing the coke drum, the flange is unbolted and the existing drum derrick 740 is used to extract the modified drill stem. Maintenance of the modified drill stem system can be performed during the decoking cycle. Spare modified drill stem systems are recommended to allow sufficient maintenance time.